

**IN THE CLAIMS**

1. (Currently amended) A method comprising:
  - providing a mold having at least one component with at least one dimension less than 100  $\mu\text{m}$ ;
  - filling the mold with a ceramic precursor; and
  - heating the ceramic precursor under a moisture-free atmosphere to produce a structure comprising of a ceramic, the structure having a Young's modulus that does not change more than 10% upon heating to 1400  $^{\circ}\text{C}$  in an inert atmosphere; and
  - removing the mold from a product formed from the ceramic precursor, wherein the step of removing the mold comprises dissolving the mold in a solution containing fluoride ions.
2. (Previously presented) The method of claim 1, wherein the ceramic precursor comprises at least two different elements.
3. (Previously presented) The method of claim 2, wherein the at least two different elements are selected from a group consisting of carbon, nitrogen, boron, silicon, phosphorus, aluminum and hydrogen.
4. (Previously presented) The method of claim 1, wherein the ceramic precursor comprises at least three different elements.
5. (Cancelled)
6. (Previously presented). The method of claim 1, wherein each element of the ceramic structure is derived from the ceramic precursor.
7. (Previously presented). The method of claim 1, wherein the step of heating is performed under an inert atmosphere.

8. (Cancelled)
9. (Original) The method of claim 1, wherein prior to the step of filling, the ceramic precursor is prepared to have sufficient viscosity to completely fill the mold.
10. (Original) The method of claim 9, wherein the viscosity of the ceramic precursor is adjusted to have a value less than about 500 cm<sup>2</sup>/s.
11. (Original) The method of claim 1, wherein prior to the step of filling, the mold is treated such that it is inert with respect to reaction with the ceramic precursor and any subsequent products resulting from the ceramic precursor.
12. (Original) The method of claim 11, wherein the step of treating the mold comprises reacting the mold with an agent selected from the group consisting of alkylating, silylating, fluoroalkylating, or alkylsilylating agent.
13. (Original) The method of claim 1, wherein the step of filling comprises positioning a surface of the mold against a surface of a substrate to create a cavity which the ceramic precursor fills.
14. (Original) The method of claim 13, wherein the substrate is selected from the group consisting of silicon, silicon dioxide, silicon nitride, and any substrate with a smooth metallic surface.
15. (Previously presented) The method of claim 13, further comprising treating the substrate surface to render the substrate inert with respect to reaction with the ceramic precursor and any subsequent products resulting from the ceramic precursor.
16. (Original) The method of claim 15, wherein the step of treating comprises silanization.

17. (Original) The method of claim 1, wherein the step of filling comprises allowing the ceramic precursor to enter a volume of lower pressure.
18. (Original) The method of claim 1, wherein the step of filling comprises allowing the ceramic precursor to enter a volume by means of capillary action.
19. (Original) The method of claim 1, further comprising the step of curing the ceramic precursor in the mold.
20. (Original) The method of claim 19, wherein the ceramic precursor is cured chemically.
21. (Original) The method of claim 19, wherein the ceramic precursor is cured thermally.
22. (Original) The method of claim 19, wherein the ceramic precursor is cured in the mold at a temperature of at least 100 °C.
23. (Original) The method of claim 19, wherein the ceramic precursor is cured in the mold under an inert atmosphere.
24. (Original) The method of claim 19, wherein the precursor is cured in the mold under a moisture-free atmosphere.
- 25-28. (Cancelled)
29. (Currently amended) The method of claim 28 1, wherein the solution contains tetrabutylammonium fluoride.
30. (Currently amended) The method of claim 25 1, wherein the product comprises a cured ceramic precursor and after removing the mold, the method further comprises heating the

cured ceramic precursor to a temperature of at least 1000 °C to produce a ceramic.

31. (Currently amended) The method of claim 25 1, further comprising transferring the product to a substrate selected from the group consisting of silicon, silicon dioxide, silicon nitride, and metal.
32. (Original) The method of claim 1, wherein the ceramic precursor is a single precursor.
33. (Original) The method of claim 1, wherein the ceramic precursor comprises a polymer.
34. (Original) The method of claim 1, wherein the ceramic precursor comprises an oligomer.
35. (Original) The method of claim 1, wherein the mold exhibits elastomeric properties.
36. (Original) The method of claim 35, wherein the mold comprises polydialkylsiloxane material.
37. (Original) The method of claim 1, wherein the step of filling the mold is performed under an inert atmosphere.
38. (Original) The method of claim 1, wherein the step of filling the mold is performed under a moisture-free atmosphere.
- 39-49. (Cancelled)

50. (Currently amended) A method comprising:

providing a mold;  
silanizing the mold; and  
filling the mold with a ceramic precursor; and  
dissolving the mold in a solution containing fluoride ions.

51. (Cancelled)

52. (Currently amended) A method comprising:

providing a silanized mold having at least one component with at least one dimension less than 100  $\mu\text{m}$ ;  
providing a ceramic precursor having sufficient viscosity to completely fill the mold, wherein the viscosity of the ceramic precursor is adjusted to have a value of less than about 500  $\text{cm}^2/\text{s}$ ; and  
thereafter, filling the mold with the ceramic precursor; and  
dissolving the mold in a solution containing fluoride ions.

53. (Currently amended) A method comprising:

providing a mold having at least one component with at least one dimension less than 100  $\mu\text{m}$ ;  
reacting the mold with an agent selected from the group consisting of an alkylating, silylating, fluoroalkylating, or alkylsilylating agent, such that the mold is inert with respect to reaction with a ceramic precursor and any subsequent products resulting from the ceramic precursor; and  
thereafter, filling the mold with the ceramic precursor; and  
dissolving the mold in a solution containing fluoride ions.

54. (Currently amended) A method comprising:

providing a mold having at least one component with at least one dimension less than 100  $\mu\text{m}$ ;

positioning a surface of the mold against a surface of a substrate to create a cavity which a ceramic precursor fills; and  
treating the substrate surface to render the substrate inert with respect to reaction with the ceramic precursor and any subsequent products resulting from the ceramic precursor; and  
dissolving the mold in a solution containing fluoride ions.

55. (Currently amended) A method comprising:

providing a silanized mold having at least one component with at least one dimension less than 100  $\mu\text{m}$ ; and  
allowing a ceramic precursor to enter a volume of lower pressure in the mold; and  
dissolving the mold in a solution containing fluoride ions.

56. (Cancelled)

57. (Currently amended) A method comprising:

providing a mold having at least one component with at least one dimension less than 100  $\mu\text{m}$ ;  
filling the mold with a ceramic precursor; and  
curing the ceramic precursor in the mold under a moisture-free atmosphere; and  
dissolving the mold in a solution containing fluoride ions.

58. (Previously presented) A method comprising:

providing a mold having at least one component with at least one dimension less than 100  $\mu\text{m}$ ;  
filling the mold with a ceramic precursor; and  
dissolving the mold in a solution containing fluoride anions.

59. (Currently amended) A method comprising:

providing an elastomeric mold comprising polydialkylsiloxane material having at

least one component with at least one dimension less than 100  $\mu\text{m}$ ; and  
filling the mold with a ceramic precursor; and  
heating the ceramic precursor to produce a structure comprising of a ceramic, the  
structure having a Young's modulus that does not change more than 10% upon heating to  
1400  $^{\circ}\text{C}$  in an inert atmosphere; and  
dissolving the mold in a solution containing fluoride anions.

60. (New) The method of claim 50, further comprising heating the ceramic precursor to produce a structure comprising a ceramic.
61. (New) The method of claim 50, further comprising the step of curing the ceramic precursor in the mold.
62. (New) The method of claim 61, wherein the ceramic precursor is cured in the mold under an inert and/or a moisture-free atmosphere.
63. (New) The method of claim 52, further comprising heating the ceramic precursor to produce a structure comprising a ceramic.
64. (New) The method of claim 52, further comprising the step of curing the ceramic precursor in the mold.
65. (New) The method of claim 64, wherein the ceramic precursor is cured in the mold under an inert and/or a moisture-free atmosphere.
66. (New) The method of claim 53, further comprising heating the ceramic precursor to produce a structure comprising a ceramic.
67. (New) The method of claim 53, further comprising the step of curing the ceramic precursor in the mold.

68. (New) The method of claim 67, wherein the ceramic precursor is cured in the mold under an inert and/or a moisture-free atmosphere.
69. (New) The method of claim 54, further comprising heating the ceramic precursor to produce a structure comprising a ceramic.
70. (New) The method of claim 54, further comprising the step of curing the ceramic precursor in the mold.
71. (New) The method of claim 70, wherein the ceramic precursor is cured in the mold under an inert and/or a moisture-free atmosphere.
72. (New) The method of claim 55, further comprising heating the ceramic precursor to produce a structure comprising a ceramic.
73. (New) The method of claim 55, further comprising the step of curing the ceramic precursor in the mold.
74. (New) The method of claim 73, wherein the ceramic precursor is cured in the mold under an inert and/or a moisture-free atmosphere.
75. (New) The method of claim 57, further comprising heating the ceramic precursor to produce a structure comprising a ceramic.
76. (New) The method of claim 57, further comprising the step of curing the ceramic precursor in the mold.
77. (New) The method of claim 76, wherein the ceramic precursor is cured in the mold under an inert and/or a moisture-free atmosphere.

78. (New) The method of claim 58, further comprising heating the ceramic precursor to produce a structure comprising a ceramic.
79. (New) The method of claim 58, further comprising the step of curing the ceramic precursor in the mold.
80. (New) The method of claim 79, wherein the ceramic precursor is cured in the mold under an inert and/or a moisture-free atmosphere.
81. (New) The method of claim 59, further comprising the step of curing the ceramic precursor in the mold.
82. (New) The method of claim 81, wherein the ceramic precursor is cured in the mold under an inert and/or a moisture-free atmosphere.